Comet 1910 *a*.

This comet was first photographed at the Radcliffe Observatory on January 25, although on the 20th and 22nd visual observations were made, and approximate places deduced from the circle-readings. The results of these observations are given in another part of the paper under the heading "Visual Observations."

The comet rapidly diminished in brightness, and after February 11 it was situated too low in the sky for accurate photographic work.

The results obtained from the photographs are exhibited in the following table.

Places of Comet 1910 *a*, *deduced from Photographs taken at the Radcliffe Observatory, Oxford.*

Date.	G.M.T.	Local Sidereal Time.	Apparent R.A. of Comet.	Corr. for Parallax in R.A. (p).	Log. $p\times\Delta$.	Apparent N.P.D. of Comet.	Corr. for Parallax in N.P.D. (q).	Log. $q\times\Delta$.	Observers.	Ref.
1910.	h m s	h m s	h m s	s		° ′ ″	″			
Jan. 25	5 47 11	1 58 44	21 16 36·91	+0·31	9·5352	93 34 25·2	− 6·3	0·8430	A.R. H.B.	(*a*)
25	5 58 21	2 9 56	21 16 38·69	+0·32	9·5420	93 33 47·9	− 6·3	0·8420	A.R. H.B.	(*b*)
29	6 9 9	2 36 32	21 30 31·81	+0·28	9·5479	89 11 34·0	− 5·5	0·8355	A.R. H.B.	(*c*)
29	6 20 42	2 48 7	21 30 33·41	+0·28	9·5527	89 11 6·4	− 5·5	0·8357	A.R. H.B.	(*d*)
30	6 15 58	2 47 19	21 33 14·72	+0·28	9·5514	88 21 29·4	− 5·3	0·8346	A.R. G.R.	(*e*)
Feb. 3	6 24 41	3 11 50	21 42 17·77	+0·25	9·5576	85 40 5·4	− 4·8	0·8320	R. B.	(*f*)
4	6 45 58	3 37 7	21 44 (16·)	+0·25	9·5614	85 6 (24·)	− 4·7	0·8342	R.	(*g*)
11	6 33 36	3 52 19	21 55 31·21	+0·22	9·5642	82 0 59·4	− 4·1	0·8318	R. H.B.	(*h*)

The measures were compared with standard co-ordinates computed for selected stars, whose places were deduced from the following sources:—

Authority for Adopted Places of Comparison Stars.

(*a*) (*b*)	Strassburg *A.G. Catalogue*,		7440, 7464, 7468.
(*c*) (*d*)	Nicolajew	,,	5472, 5475, 5482, Albany, A.G., 7548.
(*e*)	Albany	,,	7565, 7567, 7575, Küstner (1900), 9589.
(*f*)	,,	,,	7600, 7605, 7610, 7611.
(*h*)	Leipzig II.	,,	11053, 11062, 11065, 11070, 11071.

In the computation of the parallaxes the adopted value of the Sun's mean horizontal parallax is 8″·80, and the geocentric distances, Δ, are taken from the *Astronomische Nachrichten*, Nos. 4386 and 4387.

Remarks.

(*a*) (*b*) (*c*) (*d*) Comet's photographed image very difficult to measure; diameter 50″ to 60″.
(*g*) Image diffused; altitude 5°; only two faint star-trails found on plate. Resulting position of Comet approximate only.
(*h*) Altitude 7°.

Visual Observations of Halley's Comet and Comet 1910 *a*.

Halley's Comet.

In consequence of the comet's proximity to the Sun, which rendered it a difficult object in these latitudes, observations were discontinued after the month of February. The comet was last seen here before perihelion on February 28, when it was just visible in the 18-inch in strong twilight. After perihelion it was first looked for, and seen, with the 10-inch Barclay in the early morning of April 25.

The positions of the comet, as deduced from visual observations, being obtained from circle-readings only (except on May 22, as indicated by an asterisk), cannot lay claim to any great accuracy. They are, however, given in the following table, and may perhaps prove not wholly without interest:—

[TABLE.

Visual Observations of Comet Halley after Perihelion Passage, made at the Radcliffe Observatory, Oxford.

Date.	G.M.T.			Appar. R.A. of Comet.			Appar. N.P.D. of Comet.			Instrument.	Observers.		Ref.
1910.	h	m	s	h	m	s	°	′	″				
Apr. 24	16	28	52	23	50	18	82	12		Barclay (10-inch)	R.		(*a*)
May 20	8	24	12	5	25	53	70	58		,,	W.	R.	(*b*)
20	8	51	27	5	27	12	70	58		18-inch	A.R.	G.R.	(*c*)
22	9	15	30	7	18	52	75	44		,,	A.R.	G.R.	(*d*)
22	9	32	15*	7	19	21·3	75	44	51	,,	A.R.	G.R.	(*e*)
22	9	52	50	7	20	0	75	47		Barclay (10-inch)	H.B.		(*f*)
23	9	14	34	7	57	4	78	13		18-inch	A.R.	W.	(*g*)

Observers' Remarks.

(*a*) Apr. 24. Observed in strong twilight, using powers 45, 90, and 100. Nucleus only visible; magnitude 4, but image dull and of sensible diameter, approximately 8″. Too faint for the finder (2·7 inch) after $16^h\ 30^m$ G.M.T.

Apr. 29. $14^h\ 45^m$–$15^h\ 30^m$ G.M.T. In the 10-inch the comet appears about 3rd magnitude. Roundish, diffused, nebulosity of 40″ diameter. Nucleus stellar at times. An extension suspected in P.A. 290°–300°, but observations very difficult in rapidly increasing daylight. Thin haze over sky near eastern horizon. (A.R. and G.R.)

(*b*) May 20. Earliest opportunity for observing the comet since its passage to east of Sun.

The comet was detected in the 10-inch as a very faint nebulosity on a bright background of sunlit sky. In the finder the image was just discernible as a minute dull white patch.

(*c*) May 20. Rather brighter than ζ Tauri, 3rd mag.

(*d*) May 22. An extension or elongation of the nucleus was noticed by Dr. Rambaut in the direction P.A. 260°. This observation was corroborated by Dr. Cowell, who visited the observatory this evening.

(*e*) May 22. Position deduced from two transits of comet and star (Berl. A, *A.G.*, 2772).

(*f*) May 22. From the nucleus of the comet a beam of light proceeds towards the Sun, but curves southwards.

(*g*) May 23. Nucleus elongated (3″ or 4″) in P.A. 225°. The coma extends in same direction like a fan of about 90° vertical angle to a length of 70″. (A.R.)

Nucleus seems forked at s.p. end. Coma extends for about 2′ in P.A. 45°. (W.)

May 23. $9^h\ 15^m$ G.M.T. With the 10-inch Barclay telescope the outer edge of the coma is very indistinct, whilst the inner edge near the nucleus is sharply defined. Extending from the nucleus in the direction of the Sun is a narrow fan-shaped beam which curves round on either side, towards its extremity into the coma. It is brighter and the curving is more evident on the south side. (H.B.)

[Two photographs taken on this date (May 23) confirm the above observations.]

May 24. $9^h\ 55^m$ G.M.T. Nucleus visible to the naked eye. Magnitude 3·8, and surrounded by nebulosity 5′ in diameter. Tail just discernible in twilight and moonlight, and could be traced to a distance of 8°. Inclination of tail to vertical, 55°, towards the south. (R.)

May 25. 10^h G.M.T. The tail can be traced with the naked eye to a distance of about 30° (= distance between β Ursæ Maj. and Polaris). Rather difficult, very diffuse, no definite boundary; practically straight throughout its entire length. (H.B.)

May 31. $10^h\ 15^m$ G.M.T. Tail just visible to naked eye in twilight. Angle with vertical, 60°–65°. Brightness of head 3rd magnitude. (R.)

May 31. $10^h\ 30^m$ G.M.T. The tail is straight, and can be traced to a distance of 18°, or as far as ϕ Leonis, involving p^1 and p^2 Leonis. It is relatively bright for the first five degrees, but rather narrow with diffuse margins. (H.B.)

June 2. 10^h G.M.T. In the 18-inch, the horn extending from the nucleus at P.A. 120° is more marked than it was on May 31; the nucleus and comet generally are fainter than on that date. (A.R.)

Tail still visible to naked eye, clearly seen for five degrees and suspected five degrees farther. Magnitude of nucleus about 3. (R.)

Comet 1910 *a*.

The telegram announcing the discovery of this object was received here about 6 p.m. on January 18, when the comet had already set, and clouds prevented observations on the next afternoon. The first opportunity of observing the comet occurred late on the 20th, when it presented a striking appearance in the western sky, as described under "Observers' Remarks."

The places given in the following table were deduced from observations taken mostly when comparison-stars were not available, and generally in strong twilight, or at a low altitude. Except in two cases, as indicated by asterisks, the positions depend on circle-readings only.

Visual Observations of Comet 1910 *a, made at the Radcliffe Observatory, Oxford.*

Date.	G.M.T.			Appar. R.A. of Comet.			Appar. N.P.D. of Comet.			Instrument.	Observers.		Ref.
1910.	h	m	s	h	m	s	°	′	″				
Jan. 20	5	30	52	20	42	55	103	50		18-inch	A.R.	H.B.	(*a*)
22	5	31	17	21	0	13	98	44		,,	A.R.	H.B.	(*b*)
22	5	34	30	21	0	7	98	45		Barclay (10-inch)	R.		(*c*)
25	6	9	0	21	16	45	93	32		18-inch	A.R.	H.B.	(*d*)
26	5	33	36	21	20	37	92	17		,,	A.R.	H.B.	(*e*)
26	5	35	46	21	20	43	92	17		Barclay (10-inch)	R.		
28	5	56	47	21	27	36	90	7		,,	R.		(*f*)
29	5	43	0	21	30	29	89	12		,,	R.		
29	6	23	53*	21	30	32·7	89	10	57	,,	R.		(*g*)
Feb. 4	5	49	23*	21	44	11·4	85	7		,,	H.B.		(*h*)
15	6	47	5	22	0	56	80	39		18-inch	R.	H.B.	(*i*)

Observers' Remarks.

Jan. 20. The comet was picked up with the naked eye at $5^h\ 5^m$ G.M.T. In the Marlborough telescope (3·2-inch, power 54) the nucleus had a remarkably well-defined disc within the crescent-formed coma, and closely resembled, both in colour and diameter, the planet Mars, which was observed later in the evening. The northern boundary of the tail was very distinct. (R.)

At $5^h\ 18^m$ G.M.T. the tail measured $2\frac{1}{2}°$ in length, and shone conspicuously white against the red glow near the horizon. (A.R. and R.)

The inclination of the tail to the vertical estimated as 40° towards south. The nucleus could be followed until $5^h\ 37^m$ G.M.T., or to within a minute or so of the horizon. (R.)

(*a*) Jan. 20. Altitude $1\frac{1}{2}°$ only; corrections applied for refraction are therefore doubtful.

(*b*) Jan. 22. Estimated diameter of nucleus, 6″.

(*c*) Jan. 22 Altitude 6°. Tail inclined to vertical 45° towards south.

(*d*) Jan. 25. Single observation.

(*e*) Jan. 26. Estimated diameter of nucleus, 5″. Sky too thick for photography.

(*f*) Jan. 28. Observed in breaks of cloud.

(*g*) Jan. 29. Position obtained from two transits of comet and star (Nicolajew *A.G.*, 5468).

Jan. 29. $6^h\ 50^m$ G.M.T. From the head to a distance of about 10° the tail was straight; it then curved

sensibly towards the south, enveloping α Pegasi; here a division in the tail was clearly discernible, the lower portion, below α Pegasi, being the more luminous. The tail could be traced to a distance of 40°, or to about midway between α and γ Pegasi. The bifurcated form gave the impression that the tail had met with some resistance, causing a part to deviate at a sharp angle. Long after the comet's nucleus had set, the tail and the neighbouring zodiacal light remained visible. (R.)

Jan. 30. $6^h\ 15^m$ G.M.T. Nucleus mag. 4 to naked eye. (R.)

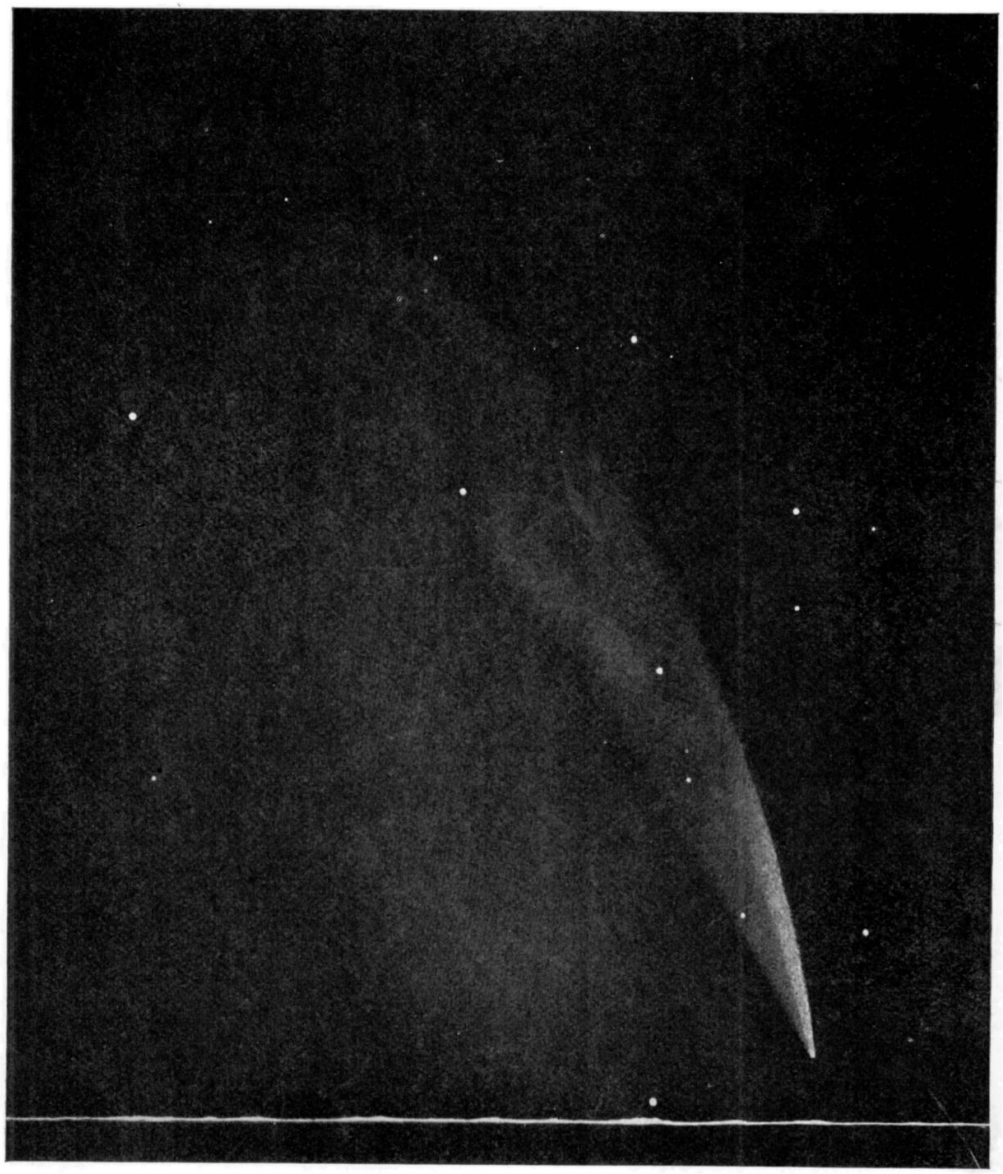
Jan. 30. $6^h\ 50^m$ G.M.T. The tail of the comet was seen distinctly separated from the zodiacal light, and could be traced as far as ρ and η Piscium (or more than 50°); near this it merged into the zodiacal band. The northern edge of the tail was sharp up to a point between α and β Pegasi, whilst the southern edge was less distinct and not so well-defined. Sky transparently clear. (H.B.)

Plate 5 is a reproduction of a drawing by Mr. H. G. S. Barrett, which represents the appearance of the comet and the zodiacal light, at Oxford, on January 30. The drawing is made on a gnomonic projection with centre at α Pegasi. The four stars forming the Great Square of Pegasus are conspicuous near the middle of the picture, whilst close to the horizon and vertically below the centre of the Square is the planet Venus (altitude $1\frac{1}{2}$°).

(*h*) Feb. 4. The comet's position depends on two ring-micrometer transits of comet and star, Albany *A.G.*, 7614.

(*i*) Feb. 15. Very faint, in twilight; altitude only $4\frac{1}{2}$°.

Radcliffe Observatory, Oxford:
1910 *December* 1.



COMET 1910a AS OBSERVED AT THE RADCLIFFE OBSERVATORY, OXFORD,
1910 JAN. 30D. 6H. 50M. G.M.T.

FROM A DRAWING BY H. G. S. BARRETT.

Observations of Stars occulted by the Moon during the Eclipse of 1910 November 16, at the Radcliffe Observatory, Oxford.

(*Communicated by Dr. A. A. Rambaut, F.R.S., Radcliffe Observer.*)

This paper contains the results of observations at the Radcliffe Observatory, Oxford, of stars occulted by the Moon during the eclipse of 1910 Nov. 16. The observations were made by Mr. H. G. S. Barrett, with the Barclay equatorial of 10 inches aperture, using a power of 90, except in one observation where 100 was employed.

The numbers given in the first column of the table below refer to M. Th. Wittram's list of selected stars in the circular issued by him on behalf of the Russian Astronomical Society.

An interesting feature in this eclipse, pointed out by M. Wittram in his introductory remarks, is that it took place in the same region of the sky as that of 1891 November 15.

In the circular referred to, the position-angles and times of occultation for Oxford were given in the case of four stars for which the disappearance or reappearance took place during the total phase. But this number was supplemented by a useful list, published by Mr. Stevens in the "Observatory" magazine for November 1910, of occultations taking place during the partial phases of the eclipse.

The results obtained are exhibited in the following table :—

No. in Pulkowa List (Wittram).	No. in B.D.	Mag. (B D.)	G.M.T. of Observation.			
			Disappearance.	Ref.	Reappearance.	Ref.
	°		h m s		h m s	
15	+18 484	6·5	10 39 51·2	(*a*)	...	...
24	+17 558	9·4	10 53 11·4	(*b*)	...	...
21	+18 487	8·3	11 10 43·5	(*c*)	11 59 55·2	(*e*)
31	+18 489	8·6	11 44 51·1	(*d*)	12 47 17·3	...
38	+18 492	8·3	12 22 33·5	(*f*)	13 16 11·4	...
37	+18 491	9·5	12 35 7·8	...	...	...
41	+18 494	8·3	12 56 58·5	(*g*)	...	...
43	+18 496	9·5	12 58 17·2	(*h*)	...	...

Mr. Barrett's Remarks.

(*a*) Disappeared at bright limb; recorded time uncertain by 2^s.

(*b*) May be 1^s in error. Position-angle about 115°. Observed with power 100.

(*c*) Disappeared at bright limb on the margin of a depression some distance from the advancing shadow.

(*d*) Angle about 90°. Star advanced a very little within the limb before disappearing instantaneously.

(*e*) Reappeared instantaneously. Moon's limb rather bright but observation good.